

Seaside Rehabilitation and Health Care Center  
Portland, Maine

SECTION 220000 - PLUMBING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The drawings and the specifications including Section 230500 "Supplemental General Mechanical Conditions" are hereby made a part of the work of this section.
- B. Drawings and general provisions of Contract including General and Supplementary Conditions and all Division 1 specification sections.
- C. Uniform Federal Accessibility Standards (UFAS).
- D. Americans with Disabilities Act (ADA).

1.2 DESCRIPTION

- A. The work covered by this Section of the specifications includes the furnishing of labor, materials, equipment, transportation, permits, inspections, and incidentals and the performing of operations required to provide a complete and functional plumbing system.
- B. Work shall be in accordance with the current edition of the Maine State Plumbing Code and applicable local ordinances.

1.3 SUBMITTALS

- A. Substitutions: Your attention is directed to Section 230500-"Substitutions", relative to competition and the (ONLY) notation. Familiarity with this section shall be achieved before reading the PRODUCTS section of this specification.
- B. The items for which the submittals paragraph in Section 230500, Supplemental General Mechanical Requirements, apply are as follows:
  - 1. Piping materials.
  - 2. Valves.
  - 3. Pipe hangers.
  - 4. Fixtures and trim.
  - 5. Miscellaneous equipment.
  - 6. Water heating equipment.
  - 7. Piping, valves and equipment identification.
  - 8. Firestopping.
  - 9. Electronic trap primers.
  - 10. Thermostatic mixing valve.
- C. Submittal Procedures: Submittal procedures.
- D. Product Data: Submit data on product characteristics, performance criteria and limitations.
- E. Manufacturer's Installation Instructions: Submit procedure for preparation and installation.

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- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

A. Soil and Waste (Sanitary) and Vent Piping, Roof Drain Piping:

1. Below Grade: Cast iron with push-on joints or Sched. 40 PVC.
2. Above Grade: Sanitary and roof drain piping shall be service weight cast iron "no Hub" (ONLY). Vent piping may be Sched. 40 PVC at contractor's option, cast iron (ONLY) thru roof.

B. Domestic Water Piping:

1. Pipe sizes larger than 1": Type L hard copper tubing and cast bronze or wrought copper solder fittings or "Flowguard Gold" Schedule 40 solvent-welded CPVC pipe and fittings. CPVC pipe and fittings shall be rated at 100 psig at 1800F and shall meet or exceed the requirements of ASTM D2846, the IBC, and be certified by the ANSI/NSF for potable water applications. Installation, including supports, shall be per the manufacturer's recommendations.
2. Pipe sizes 1" and smaller:
  - a. Uponor AquaPEX, NSF rated, 180°F at 100psi, red (HW), blue (CW) and white (RHW).
  - b. "Flowguard Gold" Schedule 40 solvent-welded CPVC pipe and fittings. CPVC pipe and fittings shall be rated at 100 psig at 180°F and shall meet or exceed the requirements of ASTM D2846, the IBC, and be certified by the ANSI/NSF for potable water applications. Installation, including supports, shall be per the manufacturer's recommendations.

C. Exposed Water and Waste Piping at Fixtures: I.P.S. copper with cast brass fittings chrome plated finish, with deep one piece escutcheon plates at traverse points.

D. Gas Piping (above grade): Schedule 40 carbon steel with threaded joints.

E. Solder: Lead-free (ONLY), Englehard Silvabrite 100, 440°F melting point, ASTM B32.

F. Radon Piping: Schedule 40 ABS with solvent-welded joints to 3'-0" above the roof.

2.2 NO HUB COUPLINGS

- A. For DWV piping, couplings shall be Clamp-All HI-TORQ125, shall maintain 15 PSI hydrostatic seal, constructed 304SS housing and ASTM C-564 neoprene gasket. Couplings shall meet FM 1680, IBC and local codes and requirements.

2.3 VALVES

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- A. Ball Valves: Copper alloy with stationary seat ring and chromium plated or stainless steel floating ball per Federal Specification WW-V-35B. Blowout proof stem, reinforced PTFE seal. Sizes 2" and larger shall have threaded ends. Provide lever handle with stem extension as required to allow operation without interfering with pipe insulation.
- B. Check Valves: Horizontal Swing, MSS SP-80, Type 3, Class 125.
- C. Drain Valves: Provide ball valves with 3/4" hose connection and brass cap.
- D. Fixture Service Stop Valves: Angle Wheel Handle Stop, ASME A112.18M.
  - 1. Each plumbing fixture shall have individual stop valves in the hot and cold supplies.
  - 2. Service stop valves exposed in finished areas shall be chrome-plated brass; in non-finished areas, ball valves shall be used in lieu of chromed supplies.
- E. Temperature and Pressure Relief Valves: Bronze body, tested under ANSI Z21.22, AGA and ASME rated, 125 psig/210°F relief settings.
- F. Fixture Service Stop Valves: Angle Loose Key Stop, ASME A112.18M.
  - 1. Each plumbing fixture and item of equipment shall have individual stop valves in the hot and cold supplies.
  - 2. Service stop valves exposed in finished areas shall be chrome-plated brass; in non-finished areas, ball valves shall be used in lieu of chromed supplies.

## 2.4 PIPE HANGERS

- A. Adjustable Swivel Hangers:
  - 1. Pipe sizes 2" and less: Carpenter and Paterson Fig. 800, oversize for insulated piping systems.
  - 2. Pipe sizes larger than 2": Carpenter and Paterson Fig. 100, oversize for insulated piping systems.
- B. Riser Clamp: Carpenter and Paterson Fig. 126 CT copper plated for copper piping, Fig. 126 for iron and PVC piping.
- A. Insulation Shields: 18 ga. galvanized steel, 180° wrap, Carpenter and Paterson Fig. 265P, Type H.

## 2.5 FIXTURES AND TRIM

- A. (P1) ADA/UFAS Water Closet: Floor-mounted, flush valve, Toto Model CT705ELN, American-Standard, Kohler, Zurn, or approved equal, elongated bowl, white vitreous china, 17"H. low consumption (1.28 gpf). Color matched trip lever shall be mounted on the wide side of the stall. Fixture shall be suitable for 12" rough-in.
  - 1. Seat: Toto SoftClose Model SS114, Church, or equal, heavy weight solid plastic,

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open front without cover, self sustaining check hinge, for elongated bowl, white color.

2. Total installed height of front edge of seat shall be 17" to 19" above finished floor. Final installation shall meet ADA guidelines and ANSI A117.1 and UFAS.
  3. Flush valve: Sloan "Solis" Model 8111, Delta, or equal, automatic electronic solar powered flushometer with battery back-up and active infrared technology. The flush valve shall have a manual override button. Additional features shall include a sentinel flush that operates every 72 hours after the last flush. Coordinate the flush valve rough-in height to provide the required clearances at grab bars.
- B. (P2) Lavatory, Countertop: Solid surface countertop with integral lavatory shall be furnished by others.
1. Faucet: Chicago-Faucets Model SF-2350, electronic infrared, battery-operated, 0.5 GPM flow aerator, thermostatic mixer, polished chrome finish, with hot and cold mixing feature, back check valves..
  2. Drain: perforated grid strainer with offset tailpiece and bright metal finish.
  3. Trap: Chrome-plated, cast copper alloy, 1-1/4" P-trap with cleanout plug. Adjustable with connected elbow and nipple to wall. Insulate trap and supplies with Truebro Model 102 insulation kit with PVC cover.
  4. ADA lavatories shall be installed at 34" above finished floor. Final installation of lavatory and accessories shall meet ADA guidelines and ANSI A117.1.
  5. (T) indicates with a trap primer fitting.
- C. (P3) Aqua-Bath Model C4136BF-3/4", Aqua-Glass or Aquarius, ADA / ANSI compliant, 41"x36" molded acrylic with 2" threshold (all units except ADA units as identified on the Architectural Drawings) or 3/4" threshold (ADA units only as identified on the Architectural Drawings), collapsible dam by KR Specialties, integral fold-up seat and stainless steel grab bars, blocking as required, dome light, curtain rod, weighted shower curtain and soap dish.
1. Leonard "Aquatrol" Model 4505 packaged unit, or Symmons, ADA-compliant meeting ASSE 1016 requirements. Pressure balanced, non-scald, mixing valve with lever handle, concealed screw check-stops, maximum limit stop. Furnish with institutional vandal-resistant, 1.8 GPM (maximum), Alsons, or equal, vandal-resistant showerhead and with a wall/hand-held shower, diverter, vacuum breaker, flexible metal hose and 24" slide bar. Provide a 2" shower drain. See Drawings.
  2. Installation of shower and accessories shall meet ADA guidelines and ANSI A117.1.
- D. (P4) ADA/UFAS Stainless Steel Sink, Single Bowl: Elkay LRAD2521, Just, or approved equal, stainless steel, 25"x21.25" overall size, 5" deep, 4 faucet holes on 4" centers, fully sound deadened.

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1. Faucet: Symmons Symmetrix Model S-23-2-10 wrist operation handle, 10-7/8" swing spout, polished chrome finish, side spray, ceramic control cartridge, single lever with pull-out side spray.
  2. Strainer: Removable basket and neoprene stopper.
  3. Sink installation shall be in compliance with the ADA/UFAS guidelines.
  4. Insulate exposed traps and supplies with Truebro Lavguard insulation.
- E. (P5) Countertop with integral Lavatory. Countertop / Lavatory furnished by the GC.
1. Faucet: Chicago-Faucets Model SF-2350, electronic infrared, battery-operated, 0.5 GPM flow aerator, thermostatic mixer, polished chrome finish, with hot and cold mixing feature, back check valves.
  2. Drain: Perforated grid strainer with offset tailpiece and bright metal finish.
  3. Trap: 1-1/4" PVC P-trap with cleanout plug. Adjustable with connected elbow and nipple to wall.
  4. Lavatory shall be installed at 34" above finished floor (See Architectural drawings). Final installation of lavatory and accessories shall meet ADA guidelines and ANSI A117.1 and UFAS. Insulate exposed traps and supplies with Truebro Lavguard.
- F. (P6) ADA Roll-In Shower: Aqua-Bath Model C6536BF-3/4", right or left hand as required, Aqua-Glass or Aquarius, ADA / ANSI compliant, 65"x36" molded acrylic with 3/4" threshold, collapsible dam by KR Specialties, and stainless steel grab bars, dome light, weighted shower curtain and soap dish.
1. Leonard "Aquatrol" Model 4505 packaged unit, or Symmons, ADA-compliant meeting ASSE 1016 requirements. Pressure balanced, non-scald, mixing valve with lever handle, concealed screw check-stops, maximum limit stop. Furnish with institutional vandal-resistant, 1.8 GPM (maximum) Alsons, or equal, vandal-resistant showerhead and with a wall/hand-held shower, diverter, vacuum breaker, flexible metal hose and 24" slide bar. Provide a 2" shower drain. See Drawings.
  2. Installation of shower and accessories shall meet ADA guidelines and ANSI A117.1.
- G. (P7) ADA Walk-In Tub: Best Bath Model XTW6035, or approved equal, 60"L.x35"W.x40"H., white gelcoat / fiberglass construction.
1. Furnish with Roman tub filler, door with seals, hand shower, thermostatic mixing valve and grab bars.
  2. Drain: Perforated grid strainer with offset tailpiece and bright metal finish.
  3. Trap: 1-1/4" PVC P-trap with cleanout plug. Adjustable with connected elbow and nipple to wall.

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4. The tub shall be installed per the manufacturers recommendations.
- H. (P8) Mop Service Sink: Fiat Model MSB-2424, floor mounted sink, molded stone or terrazzo, 24"x24"x10" high with stainless steel wall guards, hose and hose bracket. The faucet shall be a Speakman "Commander", ¼ turn faucet with ceramic cartridges, chrome-plated brass construction threaded hose connection, pail hook, top brace and vacuum breaker.
- I. Provide stops on hot and cold water supplies to each fixture with key operators. Provide chrome-plated P-traps per Code. Caulk around all fixtures at the floor and wall with white silicone caulk.

## 2.6 MISCELLANEOUS EQUIPMENT

- A. Floor Drains (FD) and Overflow Roof Drains (ORD): Zurn Z-415SL, cast iron body with 2" or 3" bottom outlet, as indicated, combination invertible membrane clamp and adjustable collar. Strainer shall be 6" square, Zurn "Type SL", polished nickel-bronze. Floor drains shall have "deep seal" traps and trap primer connection, connect to nearest electronic trap primer. Roof drains shall be Froet 100C4, Zurn, or equal, Overflow Roof Drains with underdeck clamp, extension and sump, sized as indicated on the Drawings. Downspouts shall be Zurn, or equal, polished bronze.
- B. Floor/Yard Cleanout (FCO/YCO): Zurn Z-1400 adjustable floor cleanout, cast iron body, with gas and watertight ABS tapered thread plug. Provide size equal to piping served with maximum size of 4".
  1. Concrete floor finishes: Scoriated round polished bronze top.
  2. Sheet tile finishes: Scoriated square polished bronze top recessed to receive tile.
  3. Carpeted finishes: Scoriated round polished bronze top and carpet marker.
- C. Wall Cleanout (WCO): Sanitary tee with threaded raised nut or countersunk-nut cleanout plug located behind Zurn Z-1468 round stainless steel wall access cover.
- D. Vacuum Breaker: Watts Model N36, 3/4" size, 20 CFM capacity.
- E. Strainer: Watts Series 777, MIL-S-16293, bronze body wye-type, 200 WOG rating, screwed end connections, 20 mesh stainless steel, monel, or bronze screen.
- F. Water Hammer Arrestor (Shock Absorber): Plumbing and Drainage Institute listed.

### Schedule:

- "A" - Size #100 PDI - 0-11 Fixture Units
- "B" - Size #200 PDI - 12-32 Fixture Units
- "C" - Size #300 PDI - 33-60 Fixture Units

- G. Vacuum Breaker: Watts Model N36, 3/4" size, 15 CFM capacity.

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- H. Electronic Trap Primer (**ETP**): PPP Inc. PT-series, Mifab MI-200 or Zurn, 120V., atmospheric vacuum breaker, pre-set 24 hour clock, manual over-ride switch, shut-off valve, water hammer arrestor, calibrated manifold. Individually pipe to floor drain traps. In finished spaces the trap primer shall be enclosed in a flush stainless steel wall box with hinged door and tamper-resistant lock. Run trap primer piping (½" PEX) to each floor drain trap or indirect waste receptor trap as required by Code. Provide a ball shut-off valve on the inlet to the trap primer.
- I. Backflow Preventers (BFP): Conforming to AWWA C506, FCCHR-USC Manual Section 10, and UL listed. Types, sizes and capacities scheduled. Manufacturers shall be Apollo, Zurn, or Watts.
1. Reduced Pressure Zone (RPZ): Reduced pressure principle type; bronze body with stainless steel internals. Provide bronze body ball valves or NRS gate valves, test cocks, strainer and air gap fittings.
  2. Double Check (DC): Double check backflow assembly with test ports, bronze body with stainless steel springs, corrosion resistant internals, strainer, stop and waste ball valves.
  3. Atmospheric Double Check (DCA): Double check continuous pressure type with atmospheric port for low hazard applications, 250°F maximum water temperature, bronze body, strainer, stainless steel internals with rubber seals and integral strainer.

2.7 WATER HEATING EQUIPMENT

- A. Indirect-Fired Water Heaters (**IFWH-1, 2**): TurboMax, or approved equal, packaged unit of make, model, ASME construction and performance as scheduled on Drawings; UL 732 and ASHRAE 90.1 compliant, with adjustable range thermostat. Set to provide 140°F water temperature. Hot and cold water connections shall be 1" (minimum).
1. The tank and tube rated working pressures shall be 125 psig (minimum).
  2. Shall have 2" thick foam or fiberglass insulation and steel storage tank. The tank shall be warranted for a minimum of three (3) years in commercial service.
  3. Installation shall be in accordance with the manufacturer's recommendations.

2.8 THERMOSTATIC MIXING VALVE (TMV)

- A.. Thermostatic Mixing Valve: Shall be Leonard, Symmons or Powers, or equal, capacities and performance as scheduled with lead-free bronze tempering valve, swivel action check-stops, thermometer, shut-offs and strainer, complying with ASSE 1017. Controller shall consist of a liquid fill thermal motor with bellows mounted out of the water, UL-listed. Installation shall be per the manufacturers recommendations.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:

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1. Prior to work of this Section, carefully inspect the installed work of other trades and verify that such work is complete to the point where this installation may properly commence.
2. Verify that plumbing may be installed in strict accordance with pertinent codes and regulations and the reviewed Shop Drawings.

3.2 INSTALLATION OF PIPING

- A. Provide and erect in accordance with the best practice of the trade piping shown on the drawings and as required to complete the intended installation. Make offsets as shown or required to place piping in proper position to avoid other work and to allow the application of insulation and finish painting to the satisfaction of the Engineer.
- B. The size and general arrangements, as well as the methods of connecting piping, valves, and equipment, shall be as indicated, or so as to meet the requirements of the Architect.
- C. Piping shall be erected so as to provide for the easy and noiseless passage of fluids under working conditions.
- D. Install unions to facilitate removal of equipment.
- E. Copper pipe shall be reamed to remove burrs.
- F. Connections between copper and steel piping shall be made with dielectric fittings.
- G. Solder joints shall be made with lead free solder. Clean surfaces to be soldered and use a paste flux. Wash joints with sodium bicarbonate and water to remove corrosive effects of heated solder paste. Caution: Lead-bearing solder is not permitted.
- H. Pipe penetrations through walls, floors and ceilings shall be in accordance with Section 15000 "Supplemental General Mechanical Requirements". Traverse points of piping shall be escutcheoned with split chrome floor and ceiling plates and spring anchors, where visible to occupancy.
- I. Provide a cleanout in the vertical position at the base of each sanitary and roof drain drop.
- J. Sanitary and vent piping shall be sized and installed at 1/4" per foot slope.
- K. All vertical and horizontal penetrations through walls, floors and ceilings shall be sealed against air movement between spaces.

3.3 PIPE HANGERS

- A. Impact driven studs are prohibited.
- B. Copper Tubing: supported at intervals with rod sizes as follows, double nuts on hangers and on beam clips.

Copper Size	Hanger Intervals	Rod Sizes
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1/2"	5'	3/8"
3/4"	6'	3/8"
1"	6'	3/8"
1-1/4"	8'	3/8"
1-1/2"	8'	3/8"
2"	10'	3/8"

- C. Cast Iron Pipe: Supported at intervals with rod sizes as follows, double nuts on hangers and on beam clips.

Cast Iron Size	Hanger Intervals	Rod Sizes
1-1/2"	5'	3/8"
2"	5'	3/8"
2-1/2"	5'	1/2"
3"	6'	1/2"
4"	7'	5/8"

- D. PVC/CPVC Pipe: Supported at 4 foot intervals.
- E. Verticals: Supported by use of clamp hangers at every story height, and at not more than 6 feet intervals for copper piping 1-1/4" and smaller size.
- F. Spring Isolators: All pipe 20' upstream and downstream of pumps.

### 3.4 CLOSING IN UNINSPECTED WORK

- A. General: Cover up or enclose work after it has been properly and completely reviewed.
- B. If any of the work is covered or enclosed prior to required inspections and review, uncover the work as required for the test and review. After review, tests and acceptance, repairs and replacements shall be made by the appropriate trades with such materials as necessary for the acceptance by the Architect and at no additional cost to the Owner.

### 3.5 CLEANUP AND CORROSION PREVENTION

- A. Upon completion of the work thoroughly clean and flush piping systems to the sewer with water.
- B. Fixtures, piping and equipment shall be thoroughly cleaned. Dirt, dust, and debris shall be removed and the premises left in a clean and neat condition.
- C. Caulk around fixtures at floor and wall.
- D. Before covering is applied to piping systems, clips, rods, clevises and other hanger attachments, and before uncovered piping is permitted to be concealed, corrosion and rust shall be wire brushed and cleaned and in the case of iron products, a coat of approved protective paint applied to these surfaces. When corrosion is from the effects of hot solder paste, the areas shall be cleaned and polished and a wash of bicarbonate of soda and water used to neutralize the acid condition.
- E. Paint exposed gas piping with two (2) coats of rust-inhibiting latex enamel paint (yellow).

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3.6 DISINFECTING

- A. After the entire potable water system is completed, cleaned and tested, and just before the building is ready to be occupied, disinfect the system as follows: After flushing the mains, introduce a water and chlorine solution for a period of not less than three hours before final flushing of the system.

3.7 TESTS

- A. Sanitary soil, waste and vent piping: Fill with water to top of vents, and test as required by Code.
- B. Water piping shall be tested to a pressure of 100 lbs. per square inch for at least 30 minutes. Pressure drop in this period shall not exceed two pounds per square inch. Leaks shall be repaired and system retested. Notify Architect 24 hours before test is to be performed.

3.8 INSTRUCTIONS

- A. On completion of the project, provide a competent technician to thoroughly instruct the Owner's representative in the care and operation of the system. The total period of instruction shall not exceed four (4) hours. The time of instruction shall be arranged with the Owner.

3.9 FIRESTOPPING

- A. Firestopping shall be performed in accordance with Specification Section on "Firestopping". All penetrations of fire-rated assemblies including walls and floors by mechanical system components (piping, ductwork, conduits, etc.) shall be firestopped as specified.

\* END OF SECTION \*